U.S. DEPARTMENT OF ENERGY
DEPARTMENT-WIDE
FUNCTIONAL AREA QUALIFICATION STANDARD

RADIATION PROTECTION QUALIFICATION STANDARD

Defense Nuclear Facilities Technical Personnel

U.S. Department of Energy
Washington, D.C. 20585

May 1995

Approval and Concurrence

The Assistant Secretary for Environment, Safety, and Health is the Management is the Management Sponsor for the Department-wide Environmental Restoration Functional Area Qualification Standard. The Management Sponsor is responsible for reviewing the Qualification Standard to ensure that the technical content is accurate and adequate for Department-wide application. The Management Sponsor, in coordination with the Human Resources organization, is also responsible for ensuring that the Qualification Standard is maintained current. Concurrence with this Qualification Standard by the Assistant Secretary for Environment, Safety, and Health is the Management is indicated by the signature below.

The Technical Personnel Program Coordinator (TPPC) is responsible for coordinating the consistent development and implementation of the Technical Qualification Program throughout the Department of Energy. Concurrence with this Qualification Standard by the Technical Personnel Program Coordinator is indicated by the signature below.

The Technical Excellence Executive Committee (TEEC) consists of senior Department of Energy Managers. This Committee is responsible for reviewing and approving the Qualification Standard for Department-wide application. Approval of this Qualification Standard by the Technical Excellence Executive Committee is indicated by the signature below.

NOTE: **The signatures below reflect concurrence and approval of this Qualification Standard for interim Implementation. Final concurrence and approval will occur in December 1995, pending comments received based upon implementation.**

CONCURRENCE:

_____	_____
Assistant Secretary for Environment, Safety and Health	Technical Personnel Program Coordinator

APPROVAL:

_____
Chairman
Technical Excellence Executive Committee

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U.S. DEPARTMENT OF ENERGY
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FUNCTIONAL AREA

Radiation Protection

PURPOSE

The Technical Qualification Program is divided into three levels of technical competence and qualification. The General Technical Base Qualification Standard establishes the base technical competence required of all Department of Energy defense nuclear facility technical personnel. The Functional Area Qualification Standards build on the requirements of the General Technical Base Qualification Standard and establish Department-wide functional competence requirements in each of the identified functional areas. Office/facility-specific qualification standards establish unique operational competency requirements at the Headquarters or Field element, site, or facility level.

The Radiation Protection Functional Area Qualification Standard establishes common functional area competency requirements for all Department of Energy radiation protection technical personnel who provide management oversight or direction impacting the safe operation of defense nuclear facilities. Satisfactory and documented completion of the competency requirements contained in this Standard ensures that technical employees possess the minimum requisite competence to fulfill their functional area duties and responsibilities. Additionally, these competency requirements provide the functional foundation to assure successful completion of the appropriate Office/facility-specific qualification standard.

APPLICABILITY

This Standard applies to all Department of Energy Radiation Protection technical personnel who provide management direction or oversight impacting the safe operation of defense nuclear facilities. Personnel designated by Headquarters or Field element line management as participants in the Technical Qualification Program are required to meet the requirements of this Standard as defined in DOE Order 3410.

IMPLEMENTATION REQUIREMENTS

The competencies contained in the Standard are divided into the following four categories:

1. General Technical
2. Regulatory
3. Administrative
4. Management, Assessment, and Oversight

Each of the categories is defined by one or more competency statements indicated by bold print. The competency statements define the expected knowledge and/or skill that an individual must

possess, and are requirements. Each of the competency statements is further explained by a listing of supporting knowledge and/or skill statements. The supporting knowledge and/or skill statements are not requirements and do not necessarily have to be fulfilled to meet the intent of the competency.

The competencies identify a familiarity level, working level, or expert level of knowledge; or they require the individual to demonstrate the ability to perform a task or activity. These levels are defined as follows:

Familiarity level is defined as basic knowledge of or exposure to the subject or process adequate to discuss the subject or process with individuals of greater knowledge.

Working level is defined as the knowledge required to monitor and assess operations/activities, to apply standards of acceptable performance, and to reference appropriate materials and/or expert advice as required to ensure the safety of Departmental activities.

Expert level is defined as a comprehensive, intensive knowledge of the subject or process sufficient to provide advice in the absence of procedural guidance.

Demonstrate the ability is defined as the actual performance of a task or activity in accordance with policy, procedures, guidelines, and/or accepted industry or Department practices.

Headquarters and Field elements shall establish a program and process to ensure that all defense nuclear facility technical personnel required to participate in the Technical Qualification Program meet the competency requirements contained in this Standard. Documentation of the completion of the requirements of this Standard shall be included in the employee's training and qualification record.

In select cases, it may be necessary to exempt an individual from completing one or more of the competencies in this Functional Area Qualification Standard. Exemptions from individual competencies shall be justified and documented in accordance with DOE Order 3410. Exemptions shall be requested by the individual's immediate supervisor, and approved one level above the individual's immediate supervisor.

Equivalencies may be granted for individual competencies based upon an objective evaluation of the employee's prior education, experience, and/or training. Documentation of equivalencies shall indicate how the competency requirements have been met. The supporting knowledge and/or skill statements may be considered when evaluating an individual's ability with respect to each competency requirement.

Training shall be provided to employees in the Technical Qualification Program who do not meet the competencies contained in the qualification standard. Departmental training will be based upon supporting knowledge and/or skill statements similar to the ones listed for each of the competency statements. Headquarters and Field elements should use the supporting knowledge and/or skill statements as a basis for evaluating the content of any training courses used to

provide individuals with the requisite knowledge and/or skills required to meet the qualification standard competency statements.

DUTIES AND RESPONSIBILITIES

The following are duties and responsibilities normally expected of defense nuclear facility technical personnel assigned to the radiation protection functional area:

A. Evaluates and determines the adequacy of the radiological protection program and determines whether the program complies with applicable codes, standards, guides, regulations, Orders, and accepted practices.

B. Appraises Operations Office and contractor facilities, procedures, operations and radiation protection programs to determine their adequacy to protect the employees and members of the general public from the effects of ionizing radiation.

C. Administers and coordinates radiation protection program(s) for the Department including independent evaluations and special studies.

D. Provides technical assistance and advice in the area of radiation protection to other organizations and independent review groups.

E. Inspects and evaluates radiological control, monitoring and personnel protection systems for safe operation.

F. Participates in accident investigations when required.

G. Reviews Office and/or contractor performance to identify trends indicative of performance or compliance problems.

H. Reviews contamination control practices to determine whether operations are conducted in a manner that controls/limits the spread of radioactive material.

I. Evaluates radioactive waste and effluent release management practices.

J. Performs reviews and evaluations of contractor ALARA policies and practices to verify technical applicability and proper implementation.

K. Reviews and comments on a wide variety of operating contractor documents.

L. Evaluates, oversees, and provides emergency preparedness and emergency response support related to radiological incidents in conjunction with contractor, Federal, State, and local officials, as required.

M. Evaluates decontamination, decommissioning, environmental restoration programs.

Additional duties and responsibilities specific to the site, the facility, the operational activities, and/or the involved organizations shall be contained in the facility-specific qualification standard(s).

BACKGROUND AND EXPERIENCE

The U. S. Office of Personnel Management's Qualification Standards Handbook establishes minimum education, training, experience, or other relevant requirements applicable to a particular occupational series/grade level, as well as alternatives to meeting specified requirements.

The preferred education and experience for radiation protection personnel is:

1. Education:

   Bachelor of Science degree in Health Physics, Radiological Science, or Nuclear Engineering, or a related physical science; or meet the alternative requirements for engineers or scientists specified in the Qualification Standards Handbook.

2. Experience:

   Industry, military, Federal and/or other Department of Energy site/facility experience that has provided specialized knowledge and/or skills associated with radiological protection activities.

REQUIRED COMPETENCIES

The competencies contained in this Standard are distinct from those competencies contained in the General Technical Base Qualification Standard. All radiation protection personnel must complete the competency requirements of the General Technical Base Qualification Standard prior to or in parallel with the completion of the competency requirements contained in this Standard. Each of the competency statements defines the level of expected knowledge and/or skill that an individual is required to possess to meet the intent of this Standard. The supporting knowledge and/or skill statements further describe the intent of the competency statements but are not requirements.

1. GENERAL TECHNICAL

NOTE: 1: When Department of Energy (DOE) directives are referenced in the qualification standard , the most recent revision should be used.

1.1 Radiation protection personnel shall demonstrate a working level knowledge of Department of Energy radiation protection program requirements as they relate to contractor activities.

Supporting Knowledge and/or Skills

a. Discuss the role of the Department with respect to the contractor radiation protection programs as related to the following radiological control elements and requirements including:

- Release of radioactive materials:
- Transportation of radioactive materials
- Contamination Control
- Radiation Work Permits
- Radiation Safety Training
- Source Controls
- Instrumentation and Calibration
- ALARA Program
- Internal Dosimetry
- External Dosimetry
- Nuclear Accident Dosimetry
- Posting and Labeling
- Respiratory Protection
- Monitoring and Survey Equipment
- Records
- X-Ray Radiation Generating Devices
- Internal Review and Audits
- Occurrence Reporting and Lessons Learned
- Organization and Administration
- Dose Calculations (internal/external)
- Biological Effects of Radiation
- Radiation Damage Mechanisms
- Shielding Design

1.2 Radiation protection personnel shall demonstrate a working level knowledge of the basic construction, operation, and theory of containment and confinement systems design.

Supporting Knowledge and/or Skills

a. Describe and explain the radiological concerns associated with the design, construction, and operation of containment and confinement systems.

b. Describe the operational characteristics of containment and confinement systems which are designed to limit or prevent the release of radioactive material.

c. Discuss the design and operational characteristics of containment and confinement systems that minimize personnel radiation exposure.

d. Discuss the content and requirements of DOE Order 6430.1A "General Design Requirements" as they relate to the design and installation of radiation protection and contamination confinement systems.

1.3 Radiation protection personnel shall demonstrate a working level knowledge of the various radiation detection, criticality and contamination monitoring systems and components.

Supporting Knowledge and/or Skills

a. Discuss the operation and application of continuous air monitors (CAMs) and area radiation monitors (ARMs).

b. Discuss the operation and application of personnel monitors and process radiation monitors.

c. Discuss the operation and application of criticality monitors as related to radiation protection issues within the Department.

1.4 Radiation protection personnel shall demonstrate a working level knowledge of the engineered radiological controls and design criteria.

Supporting Knowledge and/or Skills

a. Discuss radiological protection considerations in layout design for nuclear facilities.

b. Discuss the radiological protection considerations in the design and selection of components for nuclear facilities.

c. Discuss the concerns associated with the selection of materials and the associated finishes for components used in radiological control areas.

d. Discuss the differences and associated applications between permanent and temporary engineered radiological controls.

1.5 Radiation protection personnel shall demonstrate a working level knowledge of ALARA principles, and review and evaluate radiological programs, job planning, and job performance.

Supporting Knowledge and/or Skills

a. Describe the various components of an effective ALARA program including operations, engineering, and management controls.

b. Explain the Department's role in the oversight of contractor ALARA programs.

c. Describe how cost-benefit analysis is used in the ALARA process.

d. Describe the various radiological performance indicators that are applicable to the ALARA process.

e. Discuss the essential elements of the job planning process and the post-job ALARA review for work performed in a radiation or radioactive contamination area.

f. Using knowledge of ALARA principles, perform an evaluation of a radiation job plan and the associated worker job performance.

2. REGULATORY

NOTE: 1: When Department of Energy (DOE) directives are referenced in the qualification standard , the most recent revision should be used.

2.1 Radiation protection personnel shall demonstrate a working level knowledge of the following Federal regulations, codes, notices and DOE Orders related to radiation protection.

- **10 CFR 835, Occupational Radiation Protection**
- **DOE N5400.12, Sealed Radioactive Source Accountability**
- **DOE Order 5400.5, Radiation Protection of the Public and the Environment**
- **DOE Order 5480.4, Environmental Protection, Safety, and Health Protection Standards**
- **DOE Order 5480.11, Radiation Protection for Occupational Workers**
- **Office of Health Implementation Guides for use with Title 10 CFR Part 35**

Supporting Knowledge and/or Skills

a. Describe the relevant requirements, interrelationships and importance of the listed Orders, notices, codes, and regulations

b. Describe the methods by which Order and/or regulatory compliance is determined and communicated to Department and contractor management.

c. Discuss the role of radiation protection personnel with respect to these Orders and regulations.

2.2 Radiation protection personnel shall demonstrate a familiarity level knowledge of the following Federal regulations, codes, standards, and DOE Orders related to radioactive waste:

- **10 CFR 60, Disposal of High Level Radioactive Waste in Geologic Repositories**
- **10 CFR 61, Licensing Requirements for Land Disposal of Radioactive Waste**
- **29 CFR 1910.120, Hazardous Waste Operations and Emergency Response**
- **DOE Order 1540.2, Hazardous Material Packaging for Transport Administrative Procedures**

- **DOE Order 5400.3, Hazardous and Radioactive Mixed Waste Program**

- **DOE Order 5820.2A, Radioactive Waste Management**

Supporting Knowledge and/or Skills

a. Describe the relevant requirements, interrelationships and importance of the listed Orders and regulations.

b. Discuss the role of radiation protection personnel with respect to these Orders and regulations.

2.3 Radiation protection personnel shall demonstrate a familiarity level knowledge of the content of the following industry standards for radiation generating devices and the application of the following standards to Department of Energy radiation protection practices:

- **ANSI N43.2-1988, Radiation Safety for X-Ray Diffraction and Fluorescence Analysis Equipment**

- **ANSI N543-1974, General Safety Standard for Installations Using Non-Medical X-Ray and Sealed Gamma Ray Sources Energies Up to 10 MeV**

- **10 CFR 34, Licenses for Radiography and Radiation Safety Requirements for Radiographic Operations**

- **10 CFR 34.31, Training**

Supporting Knowledge and/or Skills

a. Describe the content of the listed industry standards and, in general terms, discuss their significance to Department radiation protection practices.

b. Compare the requirements of the documents listed above to the contents of the DOE Radiological Control Manual.

2.4 Radiation protection personnel shall demonstrate a familiarity level knowledge of the following Federal regulations, codes, standards, and DOE Orders related to safety analysis:

- **DOE Order 5480.24, Nuclear Criticality Safety**

- **DOE Order 5480.29, Employee Concerns Management System**

- **DOE Order 5480.30, Nuclear Reactor Safety Design Criteria**

- **DOE Order 5481.1B, Safety Analysis and Review System**

- **DOE Order 6430.1A, General Design Criteria**

Supporting Knowledge and/or Skills

a. Describe the relevant requirements, purpose, interrelationships and importance of the listed Orders and regulations.

b. Discuss the role of radiation protection personnel with respect to these Orders.

2.5 Radiation protection personnel shall demonstrate a familiarity level knowledge of the following Federal regulations, codes, standards, and DOE Orders related to emergency planning and preparedness as they pertain to radiological incidents:

- **29 CFR 1910.120, Hazardous Waste Operations and Emergency Response**
- **DOE Order 5500.1B, Emergency Management Systems**
- **DOE Order 5500.2B, Emergency Categories, Classes, and Notification and Reporting Requirements**
- **DOE Order 5500.3A, Planning and Preparedness for Operational Emergencies**
- **DOE Order 5500.4A, Public Affairs Policy and Planning Requirements for Emergencies**
- **DOE Order 5500.5A, Public Affairs Policy & Planning Requirements for a Fuel Supply Disruption Emergency**
- **DOE Order 5500.6B, Shutdown of Departmental Operations Upon Failure by Congress to Enact Appropriations**
- **DOE Order 5500.7B, Emergency Operating Records Protection Program**
- **DOE Order 5500.8A, Energy Emergency Planning and Management**
- **DOE Order 5500.9A, Emergency Planning, Preparedness, and Response to Continuity of Government Emergencies**
- **DOE Order 5500.10, Emergency Readiness Assurance Program**
- **DOE Order 5530.3, Radiological Assistance Program**
- **DOE Order 5530.5, Federal Radiological Monitoring and Assessment Center**

Supporting Knowledge and/or Skills

a. Describe the relevant requirements, purpose, interrelationships and importance of the listed Orders and regulations.

b. Discuss the role of radiation protection personnel with respect to these Orders.

2.6 Radiation protection personnel shall demonstrate a familiarity level knowledge of the following Federal regulations, codes, standards, and DOE Orders related to Federal and contractor personnel training and qualification:

- **DOE Order 5480.18B, Accreditation of Performance-Based Training for Category A Reactors and Nuclear Facilities**

- **DOE Order 5480.20A, Personnel Selection, Qualification, Training, and Staffing Requirements at Department of Energy Reactor and Non-reactor Facilities**

- **DOE Order 3410, Training**

Supporting Knowledge and/or Skills

a. Describe the relevant requirements, purpose, interrelationships and importance of the listed Orders and guides.

b. Discuss the role of radiation protection personnel with respect to these Orders and Standards.

2.7 Radiation protection personnel shall demonstrate a working level knowledge of national and international radiation protection standards and recommendations.

Supporting Knowledge and/or Skills

a. Discuss the content and application of the following national and international documents on radiation protection:

- Radiation Protection Guidance to the Federal Agencies for Occupational Exposure (52 FR 2822)

- Recommendations of the Internal Commission on Radiological Protection, International Commission on Radiological Protection (ICRP), Publication 26

- 1990 Recommendations of the International Commission of Radiological Protection, Publication 60

- A Technical Review and Assessment of the BEIR V Report (DOE/EH-0149T), DOE Technical Review Committee

- Final Report to the Secretary of Energy, "Implications of the BEIR V Report to the Department of Energy" (DOE/EH-0158T)

- Recommendations on Limits for Exposure to Ionizing Radiation, National Council on Radiation Protection and Measurements, Report No. 91

- Limitation of Exposure to Ionizing Radiation, National Council on Radiation Protection and Measurements, Report No. 116

- The most current Annual Report/Radiation Exposures for the Department and contractor Employees
- Practices for Respiratory Protection, American National Standards Institute (ANSI Z88.2-1992)
- The Quality Factor in Radiation Protection, International Commission on Radiological Units and Measurement, Report No. 40
- Data for Use in Protection Against External Radiation, International Commission on Radiological Units and Measurement, Publication No. 51
- The Metabolism of Plutonium and Related Elements, International Commission on Radiological Units and Measurement, Publication No. 48
- Protection Against Neutron Radiation, National Council on Radiation Protection and Measurements, Report No. 38

2.8 Radiation protection personnel shall demonstrate an expert level knowledge of the contents of the DOE Radiological Control Manual.

Supporting Knowledge and/or Skills

a. Discuss the role of radiation protection personnel with respect to the guidance and requirements contained in the DOE Radiological Control Manual.

b. Discuss the purpose and requirements identified in Chapter 1 (Excellence in Radiological Control) including:

- DOE Radiological Control Manual
- Leadership in Radiological Control
- Improving Radiological Performance
- Contractor Radiological Control Organization
- Department Management

c. Discuss the purpose and requirements identified in Chapter 2 (Radiological Standards) including:

- Administrative Control Levels and Dose Limits
- Contamination Control and Control Levels
- Posting Requirements

d. Discuss the purpose and requirements identified in Chapter 3 (Conduct of Radiological Work) including:

- Planning Radiological Work
- Work Preparation
- Entry and Exit Requirements
- Radiological Work Controls
- Evaluation of Performance
- Special Applications
- Construction and Restoration Projects

e. Discuss the purpose and requirements identified in Chapter 4 (Radioactive Materials) including:

- Radioactive Material Identification, Storage and Control
- Release and Transportation of Radioactive Material
- Radioactive Source Controls
- Solid Radioactive Waste Management
- Control of Radioactive Liquids and Airborne Radioactivity
- Support Activity

f. Discuss the purpose and requirements identified in Chapter 5 (Radiological Health Support Operations) including:

- Handling Radiologically Contaminated Personnel
- Radiological Monitoring and Surveys
- Instrumentation and Calibration

g. Discuss the purpose and requirements identified in Chapter 6 (Training and Qualification) including:

- General Employee Radiological Training
- Radiological Worker Training
- Radiological Control Technician Qualification
- Other Radiological Training

h. Discuss the purpose and requirements identified in Chapter 7 (Radiological Records) including:

- Employee Records
- Radiological Control Procedures
- Radiological Surveys and Instrument and Calibration Records

2.9 Radiation protection personnel shall demonstrate a familiarity level knowledge of the guidance provided in DOE Order 5480.19 "Conduct of Operations" as related to the oversight of site/facility conduct of radiological work activities.

Supporting Knowledge and/or Skills

a. Discuss the relationship between the guidelines provided in the DOE Radiological Control Manual and the guidance provided in DOE Order 5480.19.

b. Explain the responsibilities of radiation protection personnel relative to implementation of the requirements of DOE Order 5480.19 as related to radiation protection and contamination control work activities.

2.10 Radiation protection personnel shall demonstrate a familiarity level knowledge of the Federal regulations, guidelines, and Orders pertaining to the decontamination and decommissioning of nuclear facilities:

Supporting Knowledge and/or Skills

a. Discuss the application of the Department's Guidelines for Formerly Utilized Sites Remedial Action Program (FUSRAP) established in 1974 and the Surplus Facilities Management Program (SFMP) established in 1978.

b. Discuss the role of radiation protection personnel with respect to the Radiological Guidelines for Application to the Department's Formerly Utilized Sites Remedial Action Program (ORO-831, March 1983).

c. Discuss the contents of the responsibilities and requirements sections of DOE Order 5820.2A, Radioactive Waste Management.

2.11 Radiation protection personnel shall demonstrate a familiarity level knowledge of the technical safety requirements (TSRs) related to radiation protection activities in accordance with DOE Order 5480.22 "Technical Safety Requirements."

Supporting Knowledge and/or Skills

a. Discuss the role of the technical safety requirements (TSRs) documents as they relate to the site/facility radiological control operations and activities.

b. Discuss criteria for identifying problems in meeting technical safety requirements (TSRs) and for identifying violations.

c. Discuss the requirements for reporting technical safety requirements (TSRs) violations.

2.12 Radiation protection personnel shall demonstrate a familiarity level knowledge of the Federal regulations, guidelines, and Orders pertaining to the packaging and transportation of radioactive materials.

Supporting Knowledge and/or Skills

a. Discuss the contents of the following and their applicability with respect to the responsibilities of Department radiation protection personnel:

- DOE Order 1540.3A, Base Technology for Radioactive Material Transportation Packaging Systems
- ANS 8.17, Criticality Safety Criteria for the Handling, Storage, and Transportation of LWR Fuel Outside Reactors
- ANSI N14.5, Radioactive Materials - Leakage Tests on Packages for Transport

3. ADMINISTRATIVE

NOTE: 1: When Department of Energy (DOE) directives are referenced in the qualification standard , the most recent revision should be used.

3.1 Radiation protection personnel shall demonstrate a familiarity level knowledge of contract management and administration and appraise contractor organizations participating in the radiological protection programs.

Supporting Knowledge and/or Skills

a. Discuss the key elements of the contractual relationship between the Department of Energy and its contractors.

b. Discuss the roles and responsibilities of radiation protection personnel with respect to the contract management and administration process.

3.2 Radiation protection personnel shall demonstrate a familiarity level knowledge of the general principles associated with project management.

Supporting Knowledge and/or Skills

a. Discuss the purpose and requirements of DOE Order 4700.1, Project Management System.

b. Discuss the radiation protection personnel responsibilities related to project management, administration, and coordination of the radiation protection programs.

c. Discuss the essential team skills needed to effectively interface with peers, Department and contractor management.

3.3 Radiation protection personnel shall demonstrate a familiarity level knowledge of effective negotiation skills.

Supporting Knowledge and/or Skills

a. Discuss the essential elements of effective negotiation.

b. Participate in negotiation activities with peers, Department management, and contractor personnel.

4. MANAGEMENT, ASSESSMENT, AND OVERSIGHT

4.1 Radiation protection personnel shall demonstrate a working level knowledge of assessment (compliance and performance) principles and techniques necessary to identify facility and program deficiencies, best practices, potential systemic causes, and to identify corrective actions.

Supporting Knowledge and/or Skills

a. Describe the relevant aspects and process of compliance-based assessments versus performance-based assessments.

b. Describe the elements of an inspection/assessment plan (investigation, fact-finding, validation, and reporting).

c. Describe methods used to identify, develop, and group systemic deficiencies identified at the radiation protection program level and facility-specific level.

d. Explain documentation requirements used for the assessment processes.

e. Describe five performance indicators that would indicate the need for conducting a radiation protection audit.

f. Describe the contents of an assessment appraisal report.

g. Explain methods used to select candidates and conduct interviews for the assessment process.

h. Describe how corrective actions/recommendations are developed and communicated to line management.

i. Describe administrative methods used to track and provide closure for identified deficiencies.

4.2 Radiation protection personnel shall demonstrate the ability to evaluate the adequacy of local compliance with the requirements of the following radiation protection Orders and regulations.

- **10 CFR 835, Occupational Radiation Protection**
- **DOE N5400.12, Sealed Radioactive Source Accountability**
- **DOE Order 5480.4, Environmental Protection, Safety, and Health Protection Standards**
- **DOE Order 5400.5 Radiation Protection of the Public and Environment**
- **DOE Order 5480.11, Radiation Protection for Occupational Workers**

- **DOE N5480.10, Radiological Control Manual" (DOE/EH-0256T, Current Revision)**

- **DOE Order 5530.3, Radiological Assistance Program**

- **DOE Order 5530.5, Federal Radiological Monitoring and Assessment Center**

Supporting Knowledge and/or Skills

a. Using the listed Orders, prepare an action plan which adequately outlines interviews and observations to be conducted, and details documents to review during an evaluation of contractor compliance with radiation protection requirements.

b. Using an appropriate level of coverage, conduct an evaluation of contractor compliance with radiation protection requirements. During this evaluation, demonstrate the ability to properly conduct interviews, observations, and document reviews.

c. Given data from an evaluation, analyze the results of the evaluation to determine contractor compliance or noncompliance with the requirements.

d. Given the results from an analysis of contractor compliance or noncompliance, document the results and communicate the results to contractor and Department line management.

4.3 Radiation protection personnel shall demonstrate a working level knowledge of DOE Radiological Control Manual implementation process.

Supporting Knowledge and/or Skills

a. Describe the relationship between the DOE Radiological Control Manual, the Site Radiological Control Manual and site implementation plans.

b. Discuss the role of radiation protection personnel with respect to the oversight of the DOE and contractor Radiological Control Manuals and site implementation plans.

4.4 Radiation protection personnel shall demonstrate a working level knowledge of the implementation process for 10CFR 835 .

Supporting Knowledge and/or Skills

a. Describe the relationship between 10 CFR 835 and the site radiation protection program.

b. Discuss the role of Department radiation protection personnel with respect to the oversight of the implementation of 10 CFR 835 and the site radiation protection program.

4.5 Radiation protection personnel shall demonstrate a working level knowledge of Department of Energy and contractor radiological control programs and develop criteria for evaluating the readiness of a radiological protection program.

Supporting Knowledge and/or Skills

a. Discuss the factors which influence the scope and magnitude of a radiological protection program for a site/facility including:

- Specific facility mission
- Types and quantities of radioactive material in use at the site/facility
- Physical and chemical forms of the radioactive material
- Physical location of the site/facility in relation to population centers
- Size of the workforce
- Age of the facility
- Original facility design criteria

b. Develop specific criteria for evaluating the readiness of a radiological protection program for the following areas:

- Management Oversight
- Radiological Protection Organization
- Training
- Reviews, Audits, and Evaluations
- Radiological Protection Organization's Oversight of Radiological Design Criteria
- Radiological Safety Work Practices and Administrative Controls
- Radioactive Materials Control
- Dosimetry Program
- Radiological Safety Instrumentation and Alarms
- X-Ray and Source Radiography
- Workplace Surveys and Monitoring
- Reporting
- Development of Radionuclide-Specific Guidance
- Radiation-Producing Machines
- Radiological Accidents and Emergency Response
- Records Maintenance Requirement
- Conduct of Operations as Related to Radiological Protection
- Data and Trend Analysis

4.6 Radiation protection personnel shall demonstrate the ability to trend radiation protection-related information/data.

Supporting Knowledge and/or Skills

a. Using the appropriate process, trend and analyze operations information and discuss its relationship to industrial hygiene activities.

b. Using an actual list of performance indicators, determine what type of assessment should be performed and in what areas.

c. Given DOE Order 5480.26, "Trending and Analysis of Operations Information using Performance Indicators", discuss the key elements of the Order and provide examples of its application.

4.7 Radiation protection personnel shall demonstrate a working level knowledge of the essential elements associated with performance audits and inspections.

Supporting Knowledge and/or Skills

a. Discuss the emphasis of the DOE Radiological Control Manual with respect to audits, assessments, appraisal, and inspection.

b. Explain the differences and similarities between performance inspections and compliance inspections.

c. Discuss the elements of an inspection plan.

d. Explain how to document field notes and use them to prepare a report.

4.8 Radiation protection personnel shall demonstrate a working level knowledge of the inspection techniques used to identify event precursors.

Supporting Knowledge and/or Skills

a. Explain what is meant by an event precursor.

b. Identify potential event precursors, using a previously prepared inspection report and discuss the potential problems associated with the precursors.

EVALUATION REQUIREMENTS

The following requirements shall be met to complete the Department-wide Radiation Protection Functional Area Qualification Standard. The evaluation process identified below serves as a measurement tool for assessing whether the participants have acquired the technical competencies outlined in this Standard.

1. Documented completion of the Department-wide General Technical Base Qualification Standard in accordance with the requirements contained in that standard.

2. Documented completion of the competencies listed in this functional area qualification standard. Documentation of the successful completion of these competencies may be satisfied by a qualifying official using any of the following methods:

   - Documented evaluation of equivalencies
   - Written examination
   - Oral evaluation
   - Observation of performance

CONTINUING TRAINING AND PROFICIENCY REQUIREMENTS

Radiation protection personnel shall participate in an office/facility/position-specific program for continuing training and qualification that includes the following elements:

1. Technical education and/or training covering topics directly related to the duties and responsibilities of radiation protection personnel as determined by line management. This may include courses and/or training provided by:

   - Department of Energy
   - Other Government agencies
   - Outside vendors
   - Educational institutions

2. Training covering topics that address identified deficiencies in the knowledge and/or skill of radiation protection personnel.

3. Training in areas added to the Radiation Protection Functional Area Qualification Standard since initial qualification.

4. Specific continuing training requirements shall be documented in Individual Development Plans.